What is claimed is:

1. A method for rounding the top corner of a trench, comprising the steps of:

forming a masking layer overlying a substrate;

patterning the masking layer to form at least one opening therein to expose the substrate and form a recess region in the substrate;

oxidizing the recess region to form a first oxide layer thereon to round the top corner of the recess region;

successively etching the first oxide layer and the substrate under the opening to form the trench in the substrate; and

conformably forming a second oxide layer on the surface of the trench.

2. The method as claimed in claim 1, wherein the masking layer comprises a pad oxide layer and a silicon nitride layer thereon.

3. The method as claimed in claim 1, wherein the step of patterning the masking layer further comprises:

successively forming a boron silicate glass layer and a photoresist layer on the masking layer;

patterning the photoresist layer to form at least one second opening therein to expose the boron silicate glass layer;

etching the exposed boron silicate glass layer to expose the masking layer;

removing the patterned photoresist layer; and

etching the masking layer using the boron silicate glass layer as a mask.

4. The hard mask structure as claimed in claim 1, further removing a portion of the opening in the sidewall of the masking layer before the second oxide layer is formed.

5. The method as claimed in claim 4, wherein the portion of the opening sidewall of the masking layer is removed by hydrofluoric acid (HF) or ethylene glycol (EG) solution.

6. The method as claimed in claim 1, wherein the recess region has a depth of about 10 to 300Å.

7. The method as claimed in claim 1, wherein the recess region is oxidized by rapid thermal oxidation.

8. The method as claimed in claim 7, wherein the recess region is oxidized at a temperature of about 950 to 1200°C.

9. The method as claimed in claim 7, wherein the recess region is oxidized for 20 to 60sec.

10. The method as claimed in claim 1, wherein the first oxide layer has a thickness of about 70 to 100Å.

11. The method as claimed in claim 1, wherein the second oxide layer is formed by thermal oxidation.

12. The method as claimed in claim 1, wherein the second oxide layer has a thickness of about 110 to 140Å.

13. A method for forming a shallow trench isolation structure, comprising the steps of:

successively forming a pad oxide layer, a silicon nitride layer, and a boron silicate glass layer overlying a substrate;

successively etching the boron silicate glass layer, the silicon nitride layer, and the pad oxide layer to form at least one opening therein to expose the substrate and form a recess region in the substrate;

oxidizing the recess region by thermal oxidation to form a first oxide layer thereon to round the top corner of the recess region;

successively etching the first oxide layer and the substrate under the opening to form a trench in the substrate;

conformably forming a second oxide layer on the surface of the trench; and

filling the trench with an insulating layer to form the shallow trench isolation structure.

14. The method as claimed in claim 13, before forming the second oxide layer, further comprising the step of:

removing the boron silicate glass layer; and

removing a portion of the opening in the sidewalls of the silicon nitride layer and the pad oxide layer.

15. The method as claimed in claim 14, wherein the portion of the opening in the sidewalls of the silicon

nitride layer and the pad oxide layer is removed by hydrofluoric acid or ethylene glycol solution.

16. The method as claimed in claim 13, wherein the recess region has a depth of about 10 to 300Å.

17. The method as claimed in claim 13, wherein the recess region is oxidized at a temperature of about 950 to 1200°C.

18. The method as claimed in claim 13, wherein the recess region is oxidized for 20 to 60sec.

19. The method as claimed in claim 13, wherein the first oxide layer has a thickness of about 70 to 100Å.

20. The method as claimed in claim 13, wherein the second oxide layer has a thickness of about 110 to 140Å.